Attorney Docket No. 6655.P016 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Khosrow Lashkari

Application No.: 10/023,826

Filed: December 19, 2001

For: JOINT OPTIMIZATION OF SPEECH EXCITATION AND FILTER PARAMETERS

Examiner: David D. Knepper

Art Unit: 2626

Confirmation No.: 3163

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AMENDMENT UNDER 37 C.F.R. § 1.312(a)
AFTER ALLOWANCE

Sir:

Although the above-identified application has been allowed, applicants respectfully request that the application be amended pursuant to 37 C.F.R. § 1.312(a) as follows:

IN THE SPECIFICATION

On page 15, please replace the paragraph beginning on line 5 with the following paragraph:

The synthesis error gradient vector $\nabla_j E_s$ is now calculated by substituting formula (27) into formula (25) and formula (25) into formula (24). The updated root vector $\Lambda^{(i+1)}$ at the next iteration can then be calculated by substituting the result of formula (24) into formula (23). After the root vector $\Lambda^{(i)}$ is recalculated, the decomposition coefficients b_i

are updated prior to the next iteration using formula (17). ~~A detailed description of one algorithm for updating the decomposition coefficients is described in U.S. patent application number _____ to Lashkari et al. (Attorney Docket No. 10745/20).~~ The iterations of the gradient search algorithm are repeated until either the step-size becomes smaller than a predefined value μ_{min}, a predetermined number of iterations are completed, or the roots are resolved within a predetermined distance from the unit circle.

On page 17, please replace the paragraph beginning on line 5 with the following paragraph:

Figure 3 shows a sequence of computations that requires fewer calculations to optimize the synthesis polynominal A(z). The sequence shows the computations for one frame 50 and are repeated for each frame 62 of speech. First, the synthesized speech $\hat{s}(n)$ is computed for each sample in the frame using formula (10) 52. The computation of the synthesized speech is repeated until the last sample in the frame has been computed 54. The first roots of the synthesis filter polynomial A(z) are then computed using a standard root finding algorithm 56. Next, roots of the synthesis polynominal are optimized with an iterative gradient search algorithm using formulas (27), (25), (24) and (23) 58. The iterations are then repeated until a completion criteria is met, for example if an iteration limit is reached 60.